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PTO IDENTIFIER: Application Number 09/819,787-Conf. #6572
Patent Number

Inventor: Timothy S. Chamberlain et al.

MESSAGE TO: US Patent and Trademark Office

FAX NUMBER: (703) 872-9306

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Attorney Dkt. #: 20140-00281-US

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Copy of Reply Brief filed November 16, 2004 (18 pages)
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Application No. (if known): 09/819,787

Attorney Docket No.: 20140-00281-US

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Copy of Reply Brief filed November 16, 2004 (18 pages)

Docket No.: 20140-00281-US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Timothy S. Chamberlain et al.

Application No.: 09/819,787

Confirmation No.: 6572

Filed: March 28, 2001

Art Unit: 1765

For: SLURRY AND USE THEREOF FOR POLISHING

Examiner: S. Ahmed

COMMUNICATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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Dated: 5-10-05

Respectfully submitted,

By

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Paper No:
Appeal No: 2005-1189
Application: 09/819,787
Appellant: Timothy Scott Chamberlain et al.

Board of Patent Appeals and Interferences
Docketing Notice

Application 09/819,787 was received from the Technology Center at the Board on April 08, 2005 and has been assigned Appeal No: 2005-1189.

A review of the file indicates that the following documents have been filed by appellant:

Appeal Brief filed on: June 29, 2004
Reply Brief filed on: NONE
Request for Hearing filed on: NONE

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DATE: November 16, 2004

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Patent Number

Inventor: Timothy S. Chamberlin et al.

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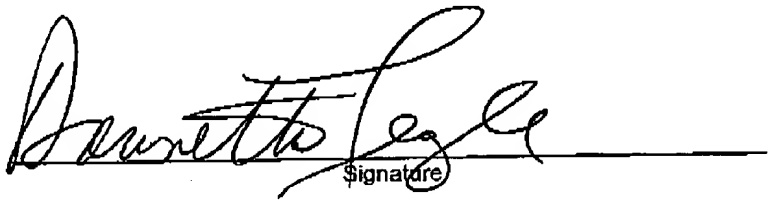

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Application Number	09/819,787-Conf. #6572
Filing Date	March 28, 2001
First Named Inventor	Timothy S. Chamberlin et al.
Art Unit	1765
Examiner Name	S. Ahmed
Attorney Docket Number	20140-00281-US

ENCLOSURES (*Check all that apply*)

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Appendix X

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

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APPENDIX X
RELATED PROCEEDINGS APPENDIX

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The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte TIMOTHY SCOTT CHAMBERLAIN, MICHAEL J. MACDONALD and MARK MURRAY

Appeal No. 2004-1884
Application 09/122,015

ON BRIEF

Before WARREN, OWENS and PAWLIKOWSKI, *Administrative Patent Judges.*

WARREN, *Administrative Patent Judge.*

Decision on Appeal

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 1 through 6, 8, 10 through 18 and 39. Claims 19 through 38[1] are also of record and have been withdrawn from consideration by the examiner under 37 CFR § 1.142(b).

Claim 1 illustrates appellants' invention of a slurry for polishing surfaces, particularly of microelectronics, and is representative of the claims on appeal:

1. A slurry composition comprising silica abrasive particles and an oxidizing agent having a static etch rate on metal of less than 1000 Å per hour; and wherein the pH of the slurry is about 7 to about 9.

The references relied on by the examiner are:

[1] Claims 1 through 6, 8 and 10 through 39 are all of the claims in the application.

Neville et al. (Neville)	5,527,423	Jun. 18, 1996
Wang et al. (Wang)	5,770,103	Jun, 23, 1998
Sakatani et al. (Sakatani)	5,804,513	Sep. 8, 1998
Ronay	5,968,280	Oct. 19, 1999

The examiner has advanced the following grounds of rejection on appeal:

claims 1 through 5 and 10 through 12 stand rejected under 35 U.S.C. § 102(e) as anticipated by Wang (answer, page 3);

claims 1 through 5, 8 and 11 through 16 stand rejected under 35 U.S.C. § 102(e) as anticipated by Sakatani (answer, pages 3-4);

claim 6 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Sakatani, as applied to claims 1 through 5, 8 and 11 through 16 above, and further in view of Ronay (answer, pages 4-5); and

claims 17, 18 and 39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang in view of Neville (answer, page 5).

Appellants state that "[w]ith respect to each rejection . . .the involved claims stand or fall together" (brief, page 2). Thus, we decide this appeal based on appealed claim 1, 6 and 17 as representative of the respective grounds of rejection. 37 CFR § 1.192(c)(7) (2003).

We reverse the grounds of rejection under § 102(e) and affirm the grounds of rejection under § 103(a). Thus, the decision of the examiner is affirmed-in-part.

Under the provisions of 37 CFR § 1.196(b) (2003), we enter a new ground of rejection of claims 1 through 6, 8, 10 through 18 and 39 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Wand, Sakatani, Ronay, and Neville. *See In re Eynde*, 480 F.2d 1364, 1370-71, 178 USPQ 470, 474-75 (CCPA 1973). Rather than reiterate the respective positions advanced by the examiner and appellants, we refer to the answer and to the brief for a complete exposition thereof.

Opinion

It is well settled that in order to apply the prior art to a claim, the claim terms must first be interpreted by giving them the broadest reasonable interpretation in light of the written description in the specification as it would be interpreted by one of ordinary skill in this art, without reading into the claim any limitation or particular embodiment which is disclosed in the specification. *See, e.g., In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). The plain

language of appealed independent claim 1, on which the other appealed claims depend, specifies a slurry composition comprising at least some amount, however small, of silica abrasive particles and some amount, however small, of any oxidizing agent that has a static etch rate on metal of less than 1000 Å per hour, wherein the pH of the slurry is about 7 to about 9. The transitional term "comprising" opens claim 1 to slurries that contain additional ingredients. *See generally, Exxon Chem. Pats., Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555, 35 USPQ2d 1801, 1802 (Fed. Cir. 1995) ("The claimed composition is defined as comprising - meaning containing at least - five specific ingredients."); *In re Baxter*, 656 F.2d 679, 686-87, 210 USPQ 795, 802-03 (CCPA 1981) ("As long as one of the monomers in the reaction is propylene, any other monomer may be present, because the term 'comprises' permits the *inclusion* of other steps, elements, or materials.").

Considering first the examiner's grounds of rejection of claim 1 under § 102(e) over Wang and over Sakatani, it is well settled that the examiner has the burden of establishing a *prima facie* case of anticipation under § 102(e) in the first instance by pointing out where each and every element of the claimed invention, arranged as required by the claim, is described identically in a single reference, either expressly or under the principles of inherency, in a manner sufficient to have placed a person of ordinary skill in the art in possession thereof. *See generally, In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990). Appellants point out that the claimed slurry is not described because Wang teaches "a pH of 1-7 and employ a pH of about 4 or 3.5 in the examples" (brief, page 5), and that Sakatani teaches that "pH is preferably about 7 or less" (*id.*). The examiner responds that both references teach the claimed pH range for the slurry (answer, pages 6 and 7).

We agree with appellants. The limitation that the pH of the slurry is about 7 to about 9 in appealed claim 1 is not described by the pH ranges having an upper limit of about 7 disclosed in Wang (col. 3, ll. 8-12) and Sakatani (col. 3, ll. 61-65), which prior art pH ranges *overlap* the claimed pH range. Thus, the claimed slurry of appealed claim 1 is not identically described in either reference within the meaning of § 102(e). *See Titanium Metals Corp. of Am. v. Banner*, 778 F.2d 775, 780, 227 USPQ 773, 777 (Fed. Cir. 1985) ("[A]nticipation under § 102 can be found only when the reference discloses exactly what is claimed and that where there are

differences between the reference disclosure and the claim, the rejection must be based on § 103 which takes differences into account. D Chisum, *Patents* § 3.02.").

Indeed, whether the difference in an overlapping range in a process or composition parameter between the claimed invention and a prior art reference renders the claimed invention unpatentable is a question of obviousness under § 103(a). *See, e.g., In re Geisler*, 116 F.3d 1465, 1470, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997), and cases cited therein; *In re Woodruff*, 919 F.2d 1575, 1577-78, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990), and cases cited therein.

Accordingly, we reverse the grounds of rejection of appealed 1 through 5, 8 and 10 through 16 under 35 U.S.C. § 102(e).

Turning now to the grounds of rejection under 35 U.S.C. § 103(a) of appealed claim 6 over the combined teachings of Sakatani and Ronay, and of appealed claim 17 over the combined teachings of Wang and Neville, we find after careful review of the record that we are in agreement with the examiner that the claimed slurries encompassed by these claims would have been obvious over the combined teachings of the applied references to one of ordinary skill in this art at the time the claimed invention was made. In comparing the claimed slurry compositions with the teachings of these references, we agree with the examiner's analysis (answer, pages 3-5) and add the following thereto. We include here consideration of the new ground of rejection under this statutory provision of claims 1 through 6, 8, 10 through 18 and 39 over the combined teachings of Wang, Sakatani, Ronay, and Neville that we entered above.

We find that Wang would have disclosed a polishing slurry composition in which the abrasive particles can comprise one of the oxides alumina, silica, ceria and zirconia; the oxidizing agent can comprise the common agents including nitrates and iodates, with potassium iodate being preferred; and a substituted phenol having at least one polar functional substituent (cols. 1 and 2). Wang further would have disclosed that the pH of the composition is generally within the range of about 1 to about 7 (col. 3, ll. 8-12). We find that Sakatani would have disclosed a polishing slurry composition in which the abrasive particles comprise at least one of aluminum oxide and silicon oxide along with cerium oxide, and an oxidizing agent that can include iodates, wherein the pH is preferably about 7 or less, and depends on the kind and

amount of oxidizing agent (cols. 1-2). Sakatani would have further disclosed that additional additives can be used with an aqueous slurry (col. 6, ll. 19-31).

We find that Ronay acknowledges known polishing slurry compositions which can include such abrasives as alumina, silicon and ceria, and such oxidizing agents as potassium iodate, ammonium cerium nitrate and potassium ferricyanide, wherein the slurry that "applies silica abrasive . . . has a more neutral pH" (col. 1, ll. 25-40). Neville would have disclosed polishing slurry compositions containing metal oxide abrasives including alumina and fumed silica, oxidizing agents including nitrates, potassium ferricyanide, sodium salts and potassium salts, and additives for aqueous slurries (cols. 3-6).

We find that, *prima facie*, one of ordinary skill in this art routinely working within either of Wang and Sakatani would have reasonably arrived at polishing slurry compositions comprising at least silica as an abrasive and an iodate or nitrate oxidizing agent, wherein the composition has a pH in a range having an upper limit of about 7. *See generally, Merck & Co., Inc. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807, 10 USPQ2d 1843, 1845-46 (Fed. Cir. 1989) ("That the '813 patent discloses a multitude of effective combinations does not render any particular formulation less obvious. This is especially true because the claimed composition is used for the identical purpose.").

We determine that, *prima facie*, polishing slurry compositions thus taught by each of Wang and Sakatani fall within appealed claim 1 as we have interpreted this claim above when the prior art polishing slurry composition has a pH of about 7. Indeed, the transitional term "comprising" opens the claimed composition to include other abrasives in addition to silicon, such as cerium oxide, and as well as the substituted phenol of Wang, and the nitrate and iodate oxidizing agents in these references reasonably appear to meet the static etch rate limitation because such compounds are disclosed to do so by appellants (specification, e.g., page 5, lines 5-11; **cf.** page 7, lines 27-28). In view of the overlap in the pH range between the claimed and prior art polishing slurry compositions, the burden is with appellants to establish the criticality of the claimed range. *See Geisler, supra; Woodruff*, 919 F.2d at 1578, 16 USPQ2d at 1936 ("The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. [Citations omitted.] These cases have

consistently held that in such a situation, the applicant must show that the particular range is *critical*, generally by showing that the claimed range achieves unexpected results relative to the prior art range. [Citations omitted.]").

With respect to the examiner's ground of rejection of appealed claim 6, dependent on appealed claim 1, we find that the combined teachings of Sakatani and Ronay provide substantial evidence in support of the examiner's position that *prima facie*, one of ordinary skill in the art would have been motivated to use ammonium cerium nitrate as an oxidizing agent in the polishing slurry composition of Sakatani (answer, pages 4-5). With respect to the examiner's ground of rejection of appealed claim 17, dependent on appealed claim 1, we find that the combined teachings of Wang and Neville provide substantial evidence in support of the examiner's position that *prima facie*, one of ordinary skill in the art would have been motivated to use a surfactant in the polishing slurry composition of Wang (answer, page 5).

Furthermore, with respect to the claimed polishing slurry compositions encompassed by appealed 2 claims through 6, 8, 10 through 18 and 39, the combined teachings of Wang, Sakatani, Ronay and Neville would have suggested that, *prima facie*, the polishing slurry compositions of Wang and Sakatani can contain silica and ceria as the abrasive particles, and potassium iodate, ammonium cerium nitrate and/or potassium ferricyanide as the oxidizing agent, as well as other additives, including surfactants, in the reasonable expectation of obtaining polishing aqueous slurry compositions as taught in these references.

Thus, *prima facie*, one of ordinary skill in this art routinely following the combined teachings of Wang, Sakatani, Ronay and Neville would have reasonably arrived at the claimed slurry compositions encompassed by appealed claims 1 through 6, 8, 10 through 18 and 39, including each and every limitation thereof, without recourse to appellants' specification. *See generally, In re Corkill*, 771 F.2d 1496, 1497-1500, 226 USPQ 1005, 1006-08 (Fed. Cir. 1985); *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980); *In re Skoll*, 523 F.2d 1392, 1397-98, 187 USPQ 481, 484-85 (CCPA 1975); *In re Castner*, 518 F.2d 1234, 1238-39, 186 USPQ 213, 217 (CCPA 1975); *In re Lintner*, 458 F.2d 1013, 1015-16, 173 USPQ 560, 562-63 (CCPA 1972); *see also In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531-32 (Fed. Cir. 1988); *In re O'Farrell*, 853 F.2d 894, 903-04, 7 USPQ2d 1673, 1680-81

(Fed. Cir. 1988) ("Obviousness does not require absolute predictability of success. . . . There is always at least a possibility of unexpected results, that would then provide an objective basis for showing the invention, although apparently obvious, was in law nonobvious. [Citations omitted.] For obviousness under § 103, all that is required is a reasonable expectation of success. [Citations omitted.]").

Accordingly, since a *prima facie* case of obviousness has been established over the combined teachings of Wang and Neville with respect to appealed claim 6 and over the combined teachings of Sakatani and Ronay with respect to appealed claim 17 as found by the examiner, we have again evaluated all of the evidence of obviousness and nonobviousness based on the record as a whole, giving due consideration to the weight of appellants' arguments and the evidence in the submitted affidavit. *See generally, In re Johnson*, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (Fed. Cir. 1984); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984).

In view of the *prima facie* case of obviousness under § 103(a) established over the combined teachings of Wang, Sakatani, Ronay and Neville with respect to claims 1 through 6, 8, 10 through 18 and 39, the burden of going forward has shifted to appellants to submit argument and/or evidence in rebuttal in this respect. *See generally, Johnson, supra*; *Piasecki, supra*.

We considered above appellants' arguments respecting the teachings of the pH of the polishing slurry compositions in Wang and Sakatani with respect to the grounds of rejection under § 102(e) (*see above* pp. 3-4). We consider with respect to the grounds of rejection under § 103(a), appellants' argument that Sakatani teaches away from the claimed pH range by disclosing that "when the pH is over about 7, the surface appearance of a metal layer after polishing is not good (see col. 3, lines 61-65)" (brief, page 5).[2] Appellants further contend that Ronay would not have suggested using a silica abrasive, cerium ammonium nitrate as an oxidizing agent or a pH of 7-9 in the compositions of Sakatani, noting that Sakatani refers to

[2] Whether Sakatani would teach away from the claimed method is not an argument that addresses the issue of anticipation. *See Celeritas Technologies Ltd. V. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522 (Fed. Cir. 1998) ("[T]he question whether a reference 'teaches away' from the invention is inapplicable to an anticipation analysis.").

cerium ammonium nitrate in the formation of the abrasive particles (brief, page 7). Appellants argue that Neville does not overcome the deficiencies of Wang because Neville fails "to suggest a slurry that is capable of polishing metal and silicon dioxide at substantially the same rates" or "suggest the need for selecting the recited pH, silica and type of oxidizer according to the present invention" (brief, page 7; see also page 5).

We cannot agree with appellants' positions. In our view, the cited passage from Sakatani would have suggested to one of ordinary skill in this art that a polishing slurry of the reference having a pH above about 7 would not achieve the same result as a slurry of the reference having a pH of about 7 and below. *See In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994) ("We share Gurley's view that a person seeking to improve the art of flexible circuit boards, on learning from Yamaguchi that epoxy was inferior to polyester-imide resins, might well be led to search beyond epoxy for improved products. However, Yamaguchi also teaches that epoxy is usable and has been used for Gurley's purpose."). Thus, this teaching does not amount to a "teaching away."[3]

The difficulty with appellants' position with respect to the teachings of Ronay is that the reference acknowledges the oxidizing agents used in polishing slurry compositions in the art, and Sakatani teaches that "known oxidizing agents" can be used in the polishing slurry compositions taught therein (col. 4, ll. 3-7). Furthermore, we find no limitation with respect to the capability of the claimed slurry to polish metal and silicon dioxide at substantially the same rates in any of the appealed claims. *See In re Self*, 671 F.2d 1344, 213 USPQ 1 (CCPA 1982). Moreover, Neville does not have to suggest all of the limitations of the claimed invention encompassed by the appealed claims in order for one of ordinary skill in the art to combine the teachings with respect to polishing slurry compositions thereof with teachings with respect to the same kind of

[3] *See Gurley*, 27 F.3d at 552-53, 31 USPQ2d 1 at 1131-32 ("A reference may be said to teach away when a person of ordinary skill, upon reading the reference would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. The degree of teaching away will of course depend on the particular facts; in general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant. [Citations omitted.]").

compositions in the other applied references. *See In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981)("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.").

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in the combined teaching of Wang and Neville and of Sakatani and Ronay as applied by the examiner with appellants' countervailing evidence of and argument for nonobviousness and conclude that the claimed invention encompassed by appealed claims 6, 17, 18 and 39 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

With respect to appealed claims 1 through 6, 8, 10 through 18 and 39, having reconsidered the evidence of obviousness in the combined teachings of Wang, Sakatani, Ronay and Neville with appellants' arguments and evidence of nonobviousness which pertain to the new ground of rejection that we have explained above, we remain of the opinion that the claimed compositions encompassed by claims 1 through 6, 8, 10 through 18 and 39 are *prima facie* obvious over the applied prior art. Thus, the burden of going forward with respect to this ground of rejection remains with appellants. *See generally, Johnson, supra; Piasecki, supra.*

The examiner's decision is affirmed-in-part.

In addition to affirming the examiner's rejection of one or more claims, this decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b) (2003). 37 CFR § 1.196(b) provides, "A new ground of rejection shall not be considered final for purposes of judicial review."

Regarding any affirmed rejection, 37 CFR § 1.197(b) (2003) provides:

(b) Appellant may file a single request for rehearing within two months from the date of the original decision . . . .

37 CFR § 1.196(b) also provides that the appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to

the new ground of rejection to avoid termination of proceedings (37 CFR § 1.197(c)) as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner. . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

Should appellants elect to prosecute further before the Primary Examiner pursuant to 37 CFR § 1.196(b)(1), in order to preserve the right to seek review under 35 U.S.C. §§ 141 or 145 with respect to the affirmed rejection, the effective date of the affirmance is deferred until conclusion of the prosecution before the examiner unless, as a mere incident to the limited prosecution, the affirmed rejection is overcome.

If appellants elect prosecution before the examiner and this does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the affirmed rejection, including any timely request for rehearing thereof.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

37 CFR § 1.196(b)

CHARLES F. WARREN
Administrative Patent Judge

TERRY J. OWENS
Administrative Patent Judge

BEVERLY A. PAWLIKOWSKI
Administrative Patent Judge

BOARD OF PATENT APPEALS AND INTERFERENCES

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Application 09/122,015

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